Occlusal Caries

Proximal Caries

Facial and Lingual Caries

Root Caries (cemental caries)

Recurrent Caries

Cervical Burnout

Beam Angulation Effects on Caries

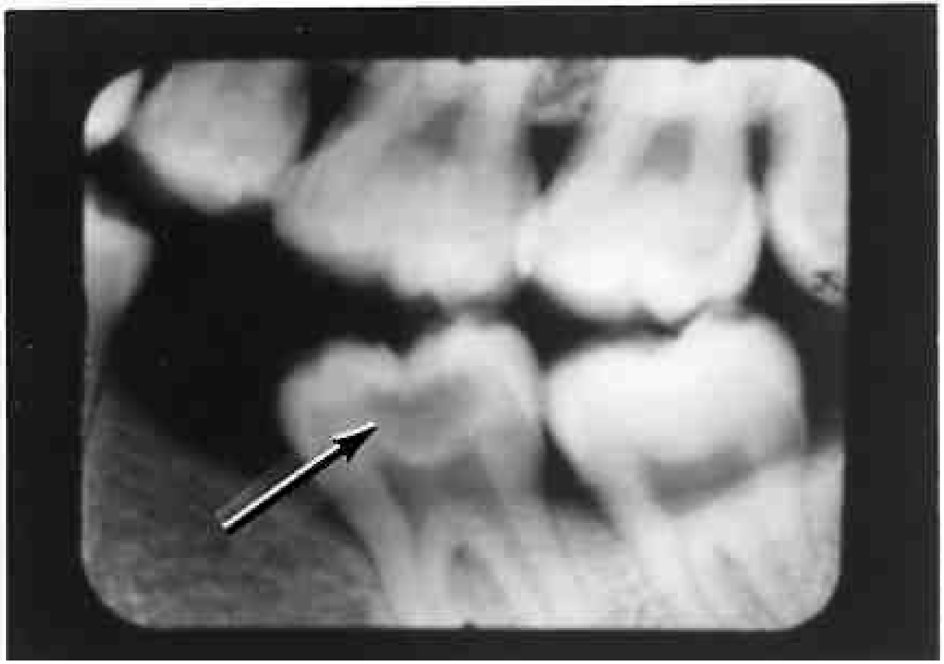


Fig. 5-1

Occlusal caries on a mandibular molar. Notice the intact enamel surface. Also observe the diffuse triangular appearance of the caries with the base of the triangle at the dentino-enamel junction and the apex towards the dental pulp.

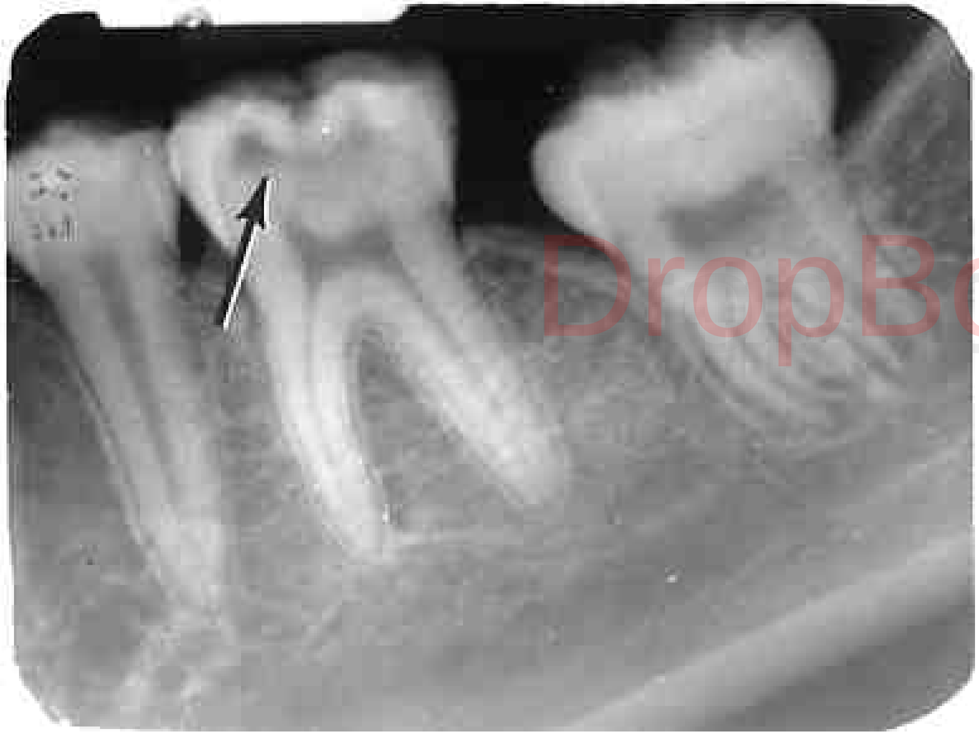


Fig. 5-2

Occlusal caries in the first molar. Occlusal caries spreads at the dentino-enamel junction and may undermine and fracture the enamel. In the enamel, caries progresses in the direction of the enamel rods; in the dentin, caries progresses in the direction of the dentinal tubules.

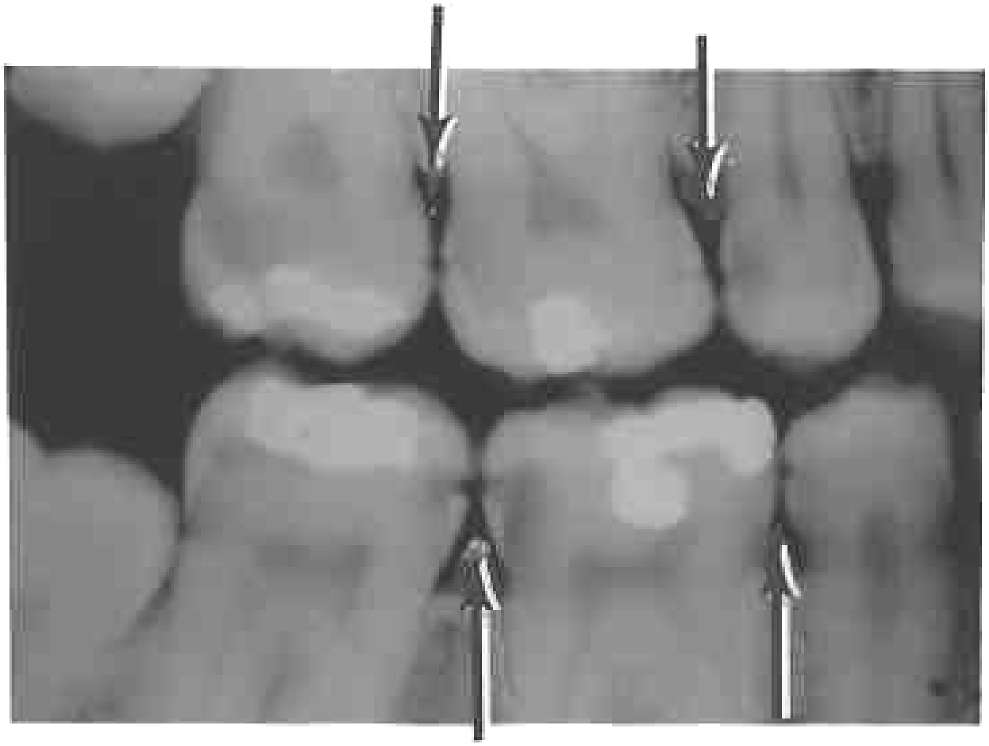


Fig. 5-3

Proximal caries on maxillary and mandibular second premolars, first molars and second molars. Caries is much larger clinically than seen on the radiograph.

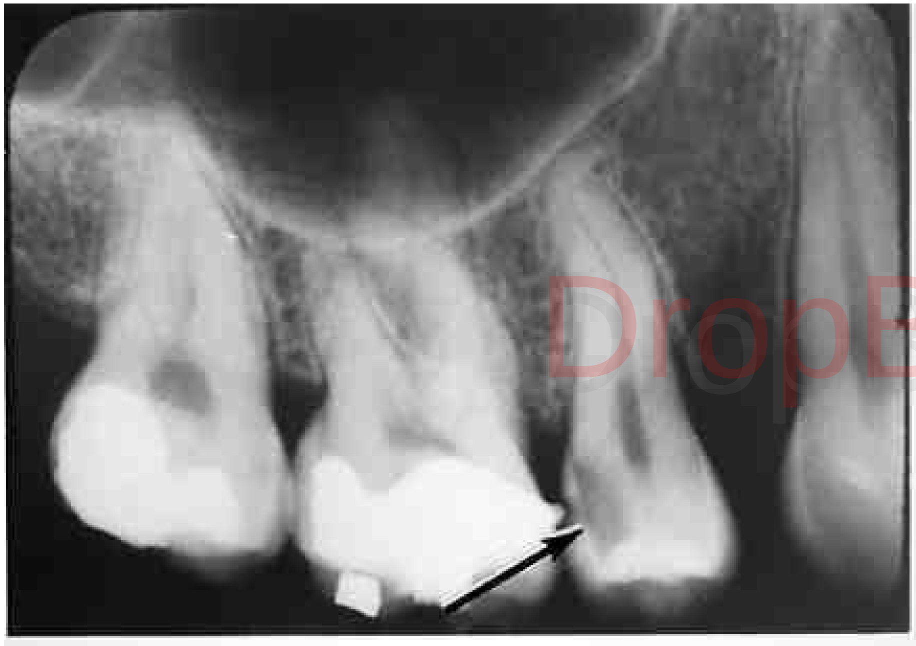


Fig. 5-4

Proximal caries on the distal surface of the second premolar. Notice the triangular appearance of caries. In the enamel, caries progresses along the path of the enamel rods; in the dentin, caries progresses roughly along the path of the dentinal tubules.

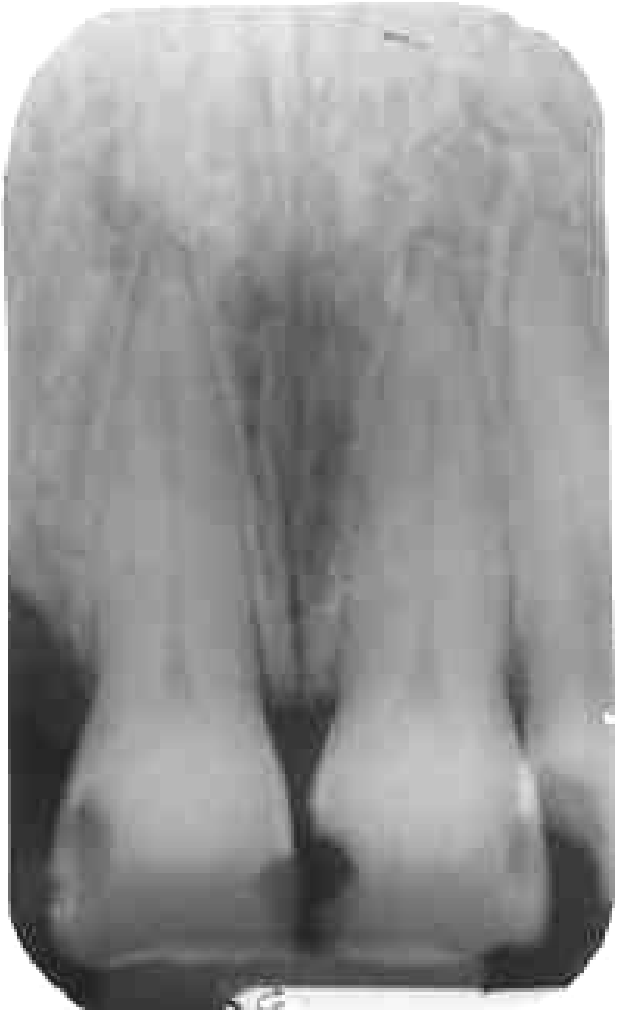


Fig. 5-5

Proximal caries on anterior teeth.

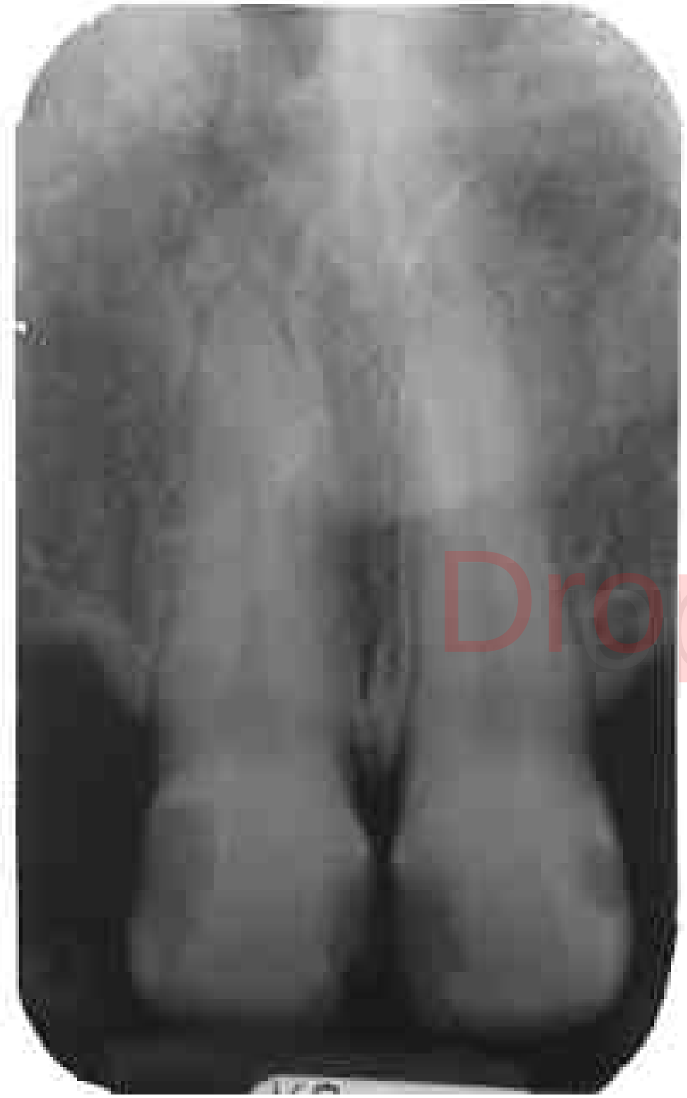


Fig. 5-6

Radiolucent restorative materials (composite) may be misdiagnosed as caries. Notice the box-like rectangular cavity preparations.

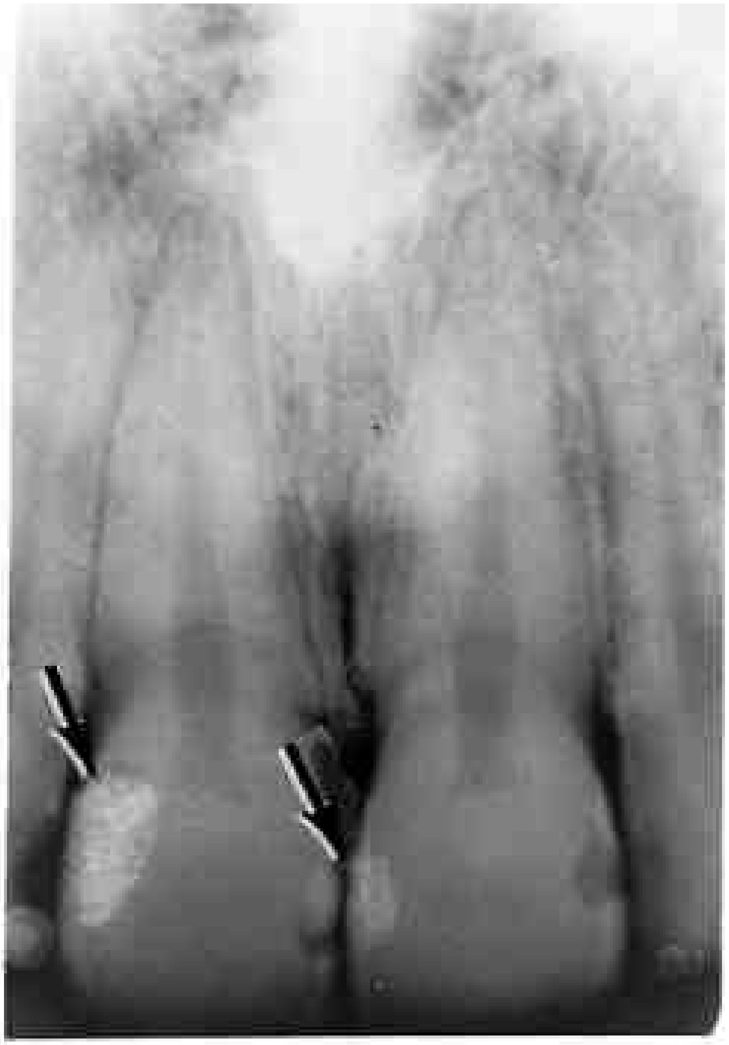


Fig. 5-7

Radiopaque particles added to radiolucent restorative materials (composite) by manufacturer to differentiate them from carious lesions.

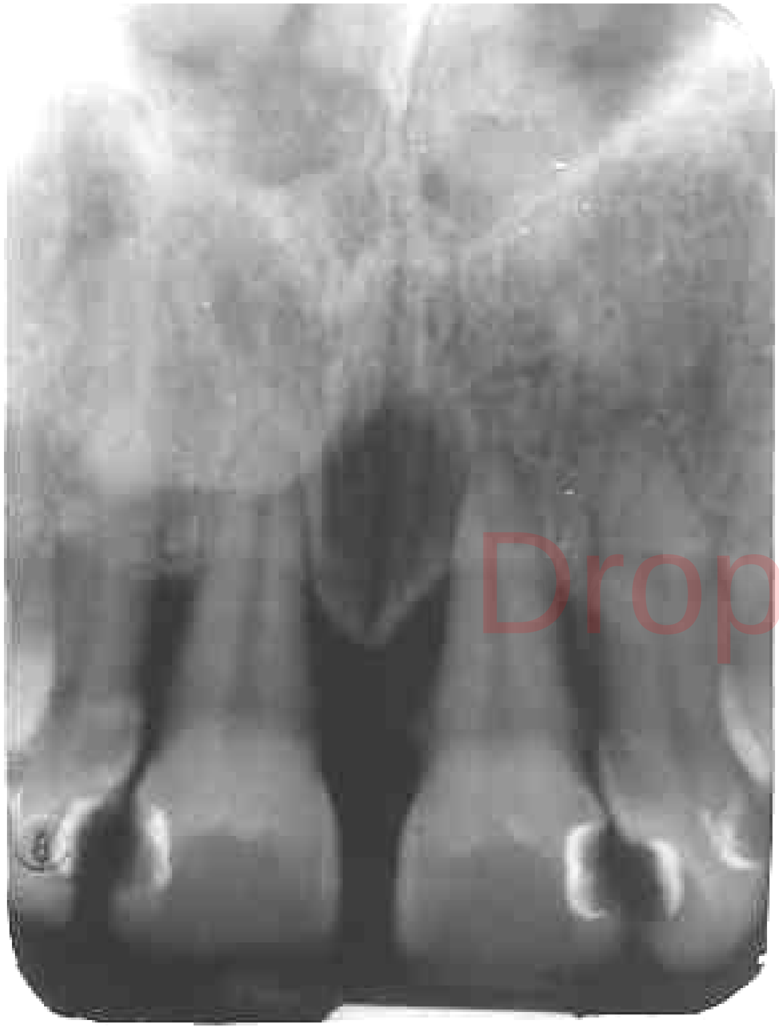
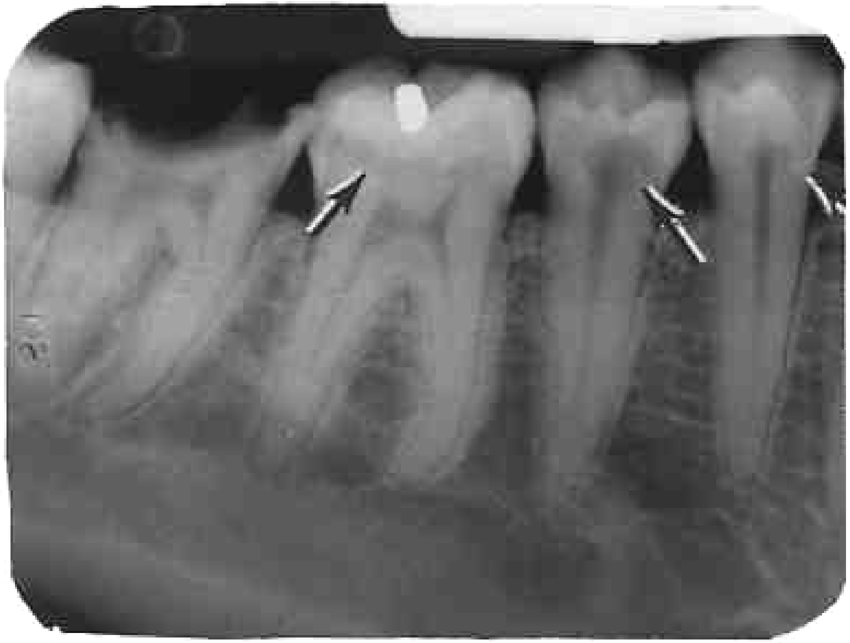


Fig. 5-8

The radiopaque cement bases underneath the radiolucent restorations differentiates them from carious lesions.

Fig. 5-9



Facial or lingual caries on first and second premolars (round or oval), and on first molar (semilunar). Facial and lingual caries usually originate in pits or grooves and later spread at the dentino-enamel junction. Enamel caries tends to follow the lines of the enamel rods; dentinal caries tends to roughly follow the lines of the dentinal tubules. The whole crown of the second molar is carious.

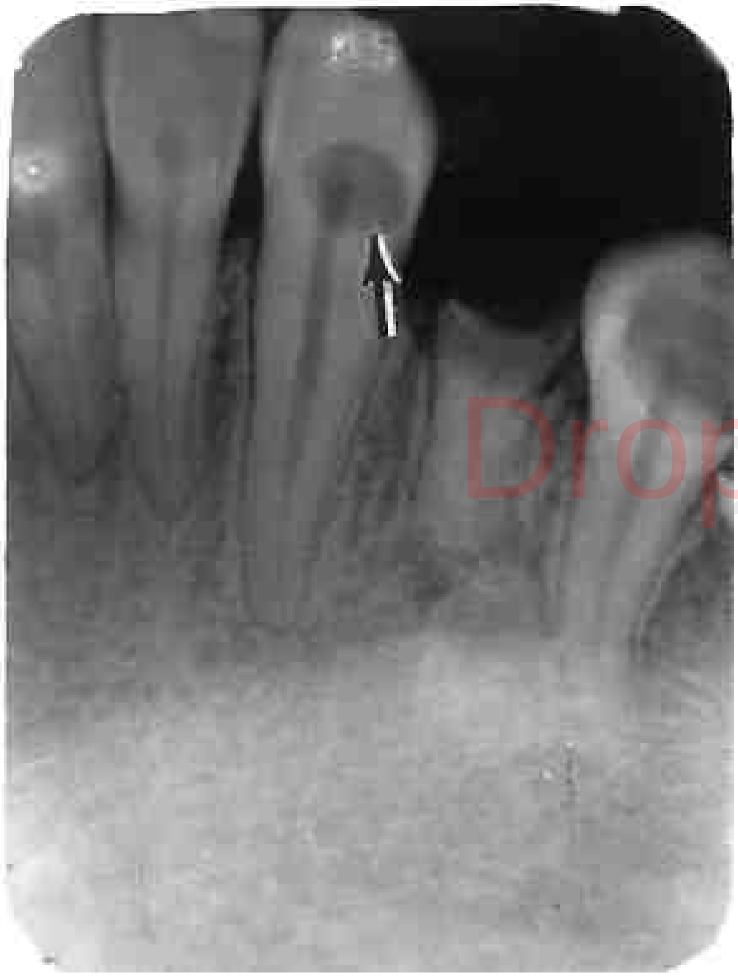


Fig. 5-10

Facial or lingual caries on the canine. Facial and lingual caries are usually well-demarcated from the surrounding sound enamel. This clear-cut outline assists in differentiating such lesions from occlusal caries. The crowns of the first and second premolars are carious.

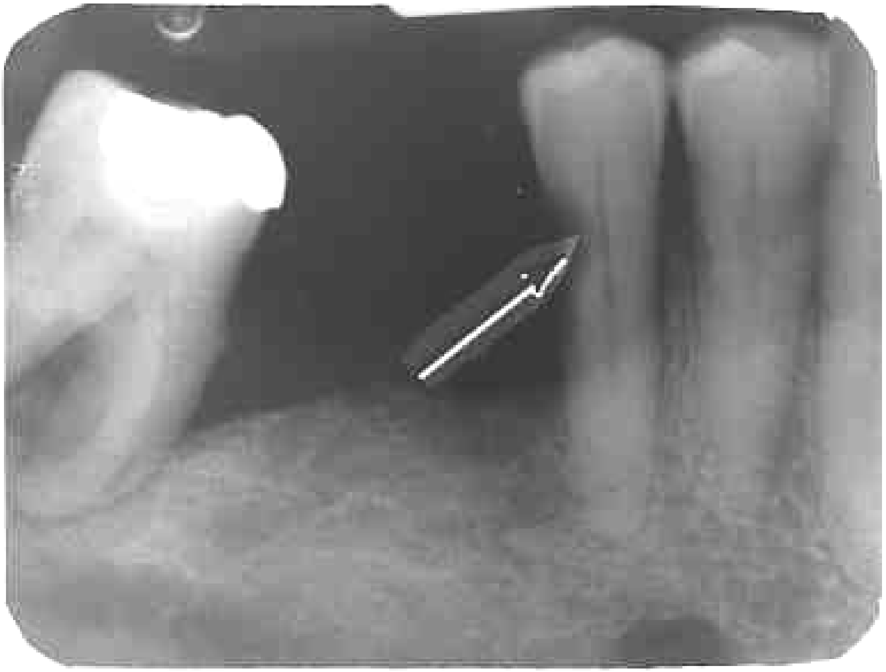


Fig. 5-11

Root caries (cemental caries) on distal of second premolar. Root caries is usually saucer shaped. Root caries does not occur in areas covered by a well-attached gingiva. There is loss of bone, resulting in the exposure of cementum.

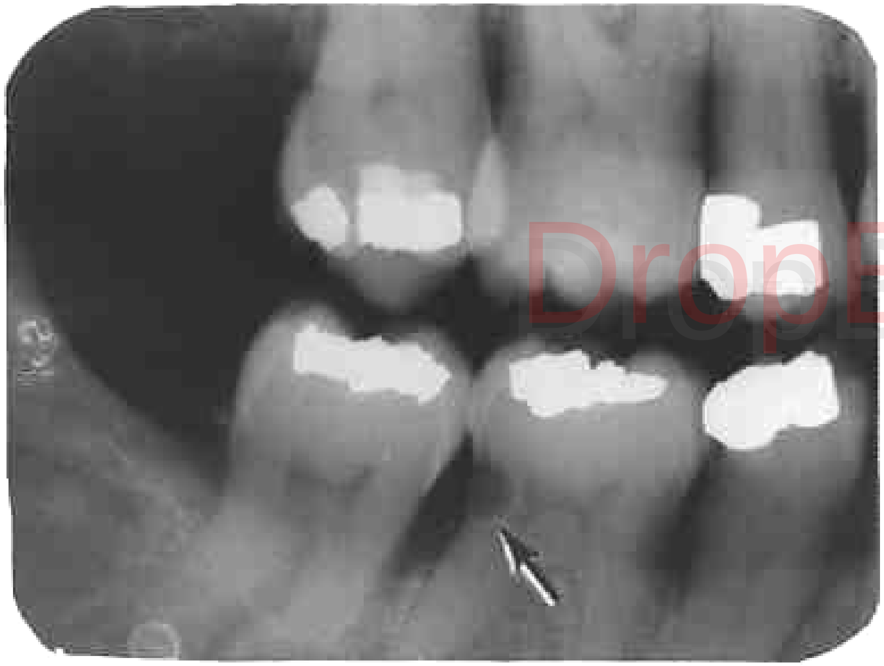


Fig. 5-12

Root caries (cemental caries) on mandibular first molar has a scooped-out appearance. There is loss of alveolar bone height, resulting in the exposure of cementum.

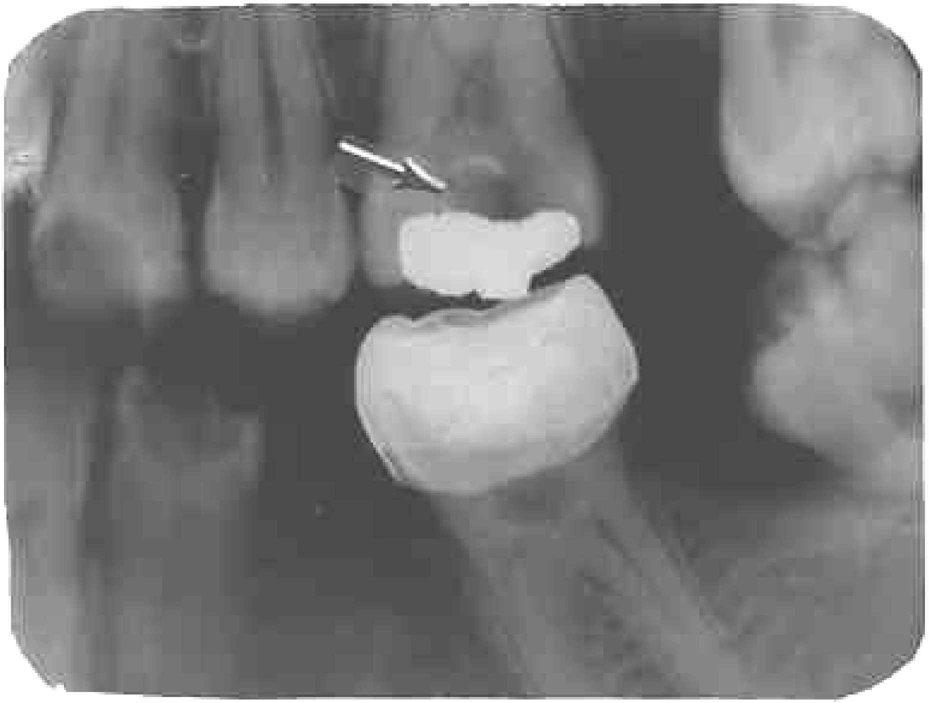


Fig. 5-13

Recurrent caries underneath the amalgam restoration of the maxillary first molar. Presence of secondary dentin (radiopaque) between the recurrent caries and the pulp chamber.

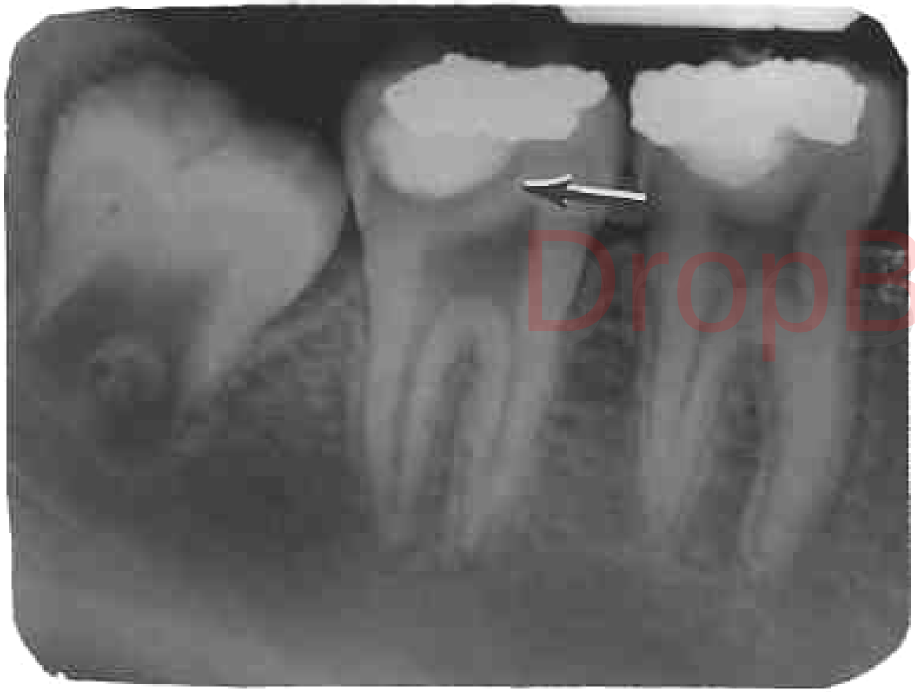


Fig. 5-14

In the second molar, the diffuse radiolucent line between the zinc phosphate base and sound dentin may be either recurrent caries or calcium hydroxide lining. Clinically, after removal of the restoration, the radiolucency was diagnosed as recurrent caries.

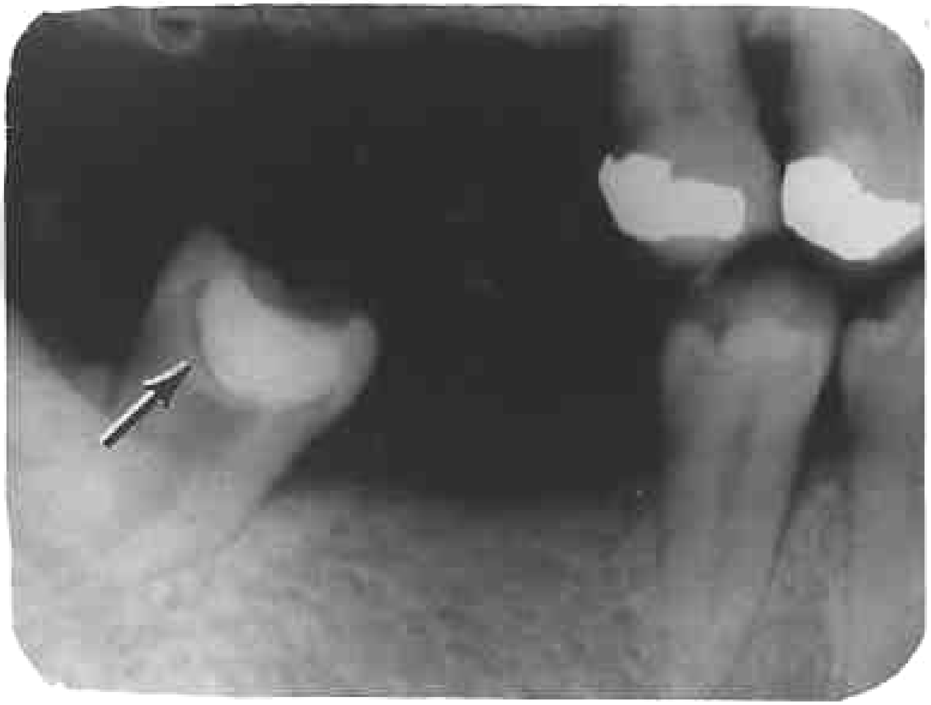


Fig. 5-15

Calcium hydroxide (thin radiolucent line) between the pulp chamber and zinc phosphate cement in the molar.

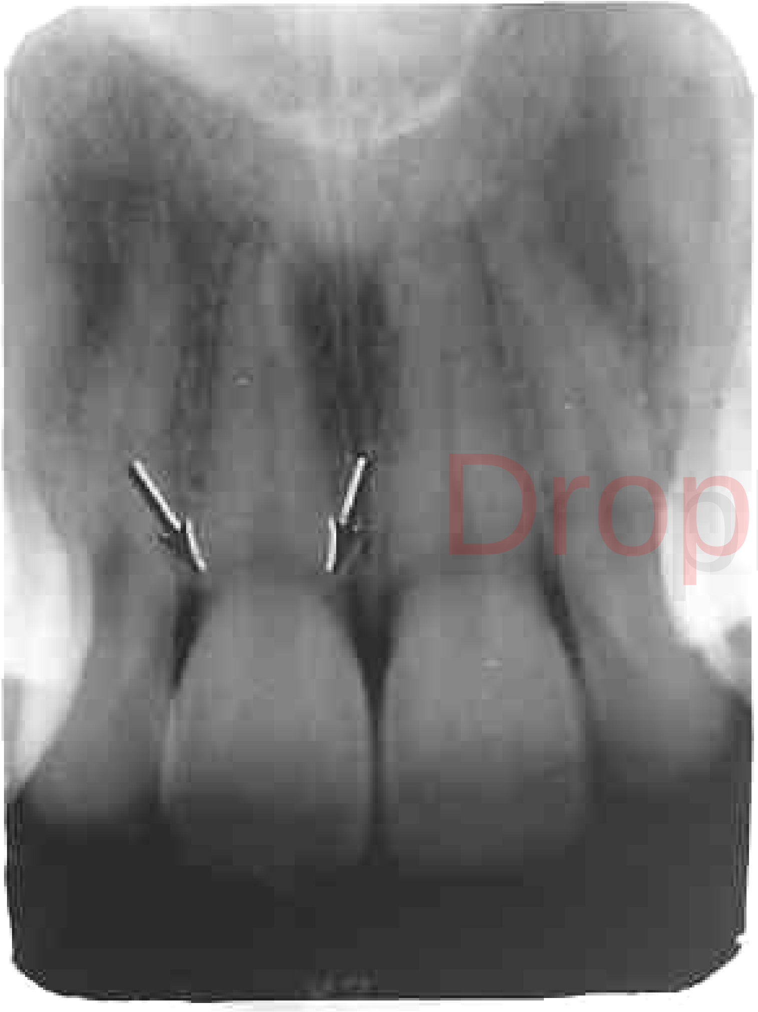


Fig. 5-16A

Cervical burnout (radiolucent band) near the necks of the central incisors. Such burnout is the result of a decrease in total structural thickness and/or a change in the hard tissue composition.

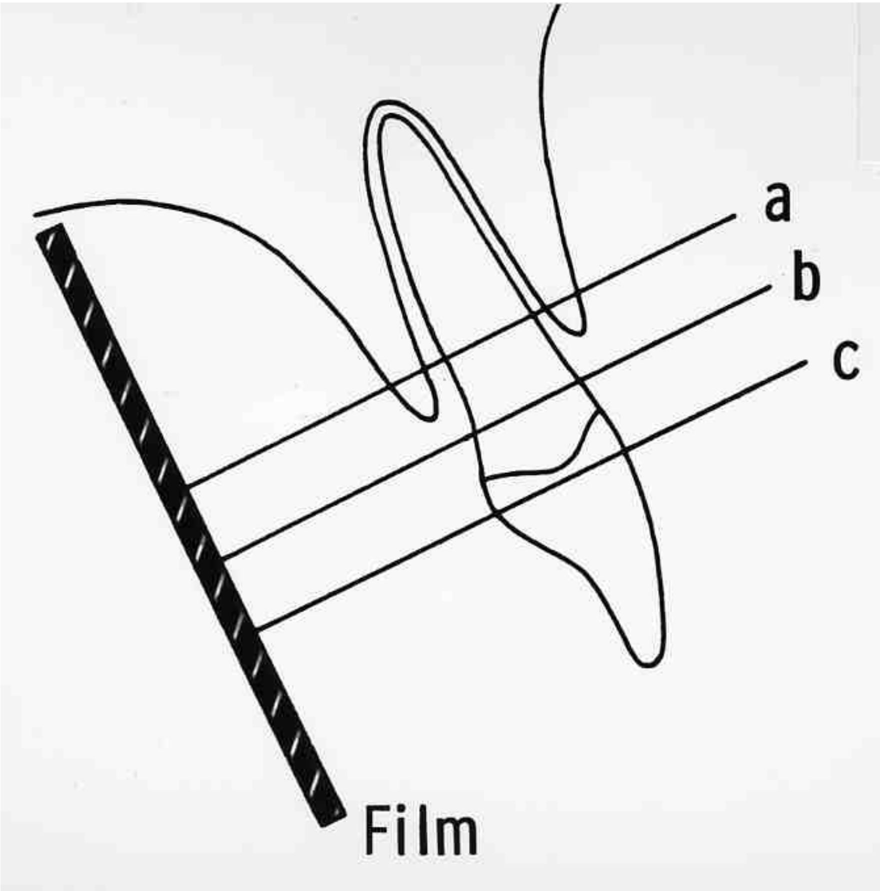


Fig. 5-16B

- Diagram illustrating the phenomenon of cervical burnout. Lines "a" and "c" penetrate more dense tissue than does line "b".
- X-ray "b" penetrates tooth structures (cementum and dentin).
- X-ray "a" penetrates tooth structures and alveolar bone.
- X-ray "c" penetrates tooth structures and enamel.
- Cervical burnout can also be caused by root configuration and the shape of the cemento-enamel contour.

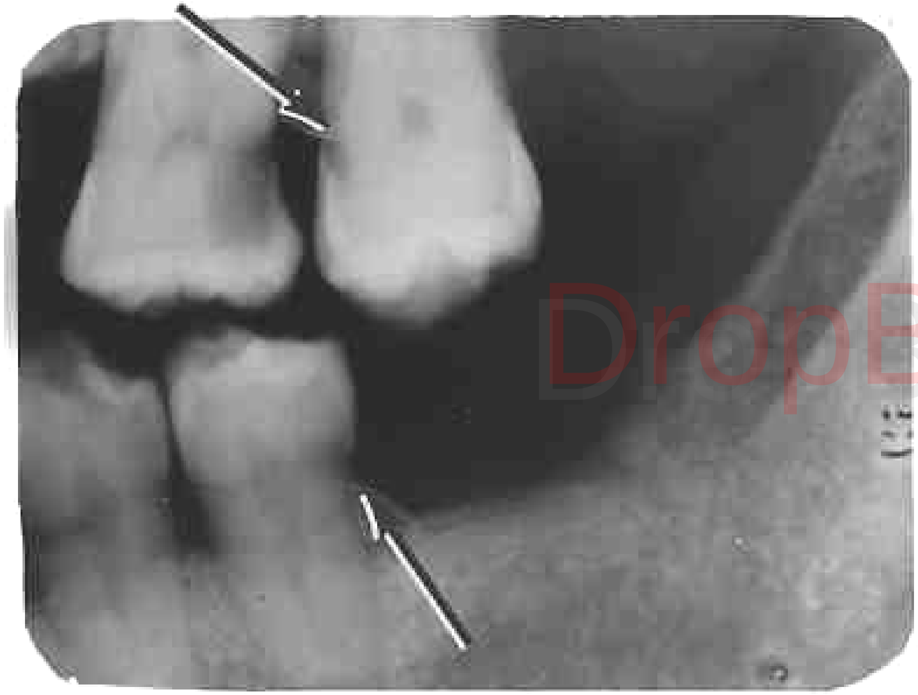


Fig. 5-17

Cervical burnout and root caries. The distal surface of the mandibular second premolar and the mesial surface of the maxillary second molar (arrows) show cervical burnout whereas the distal of the maxillary first molar shows root caries.

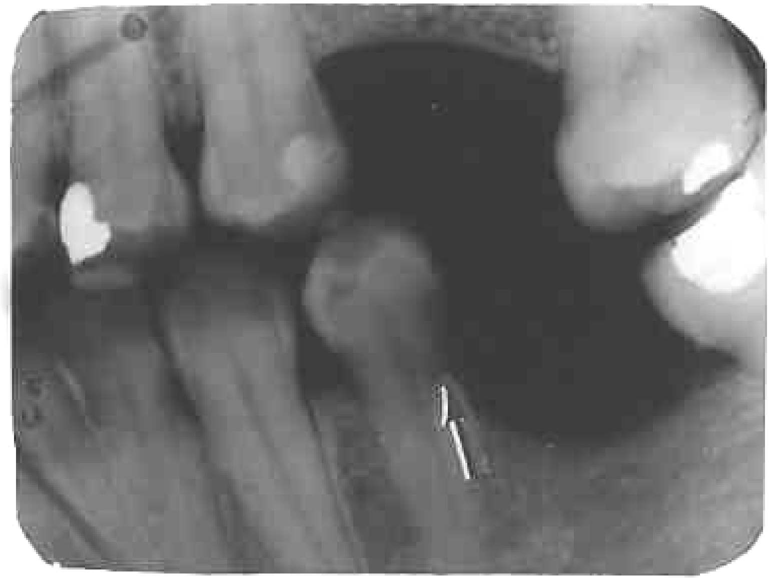


Fig. 5-18A

Cervical burnout on distal of mandibular first premolar.

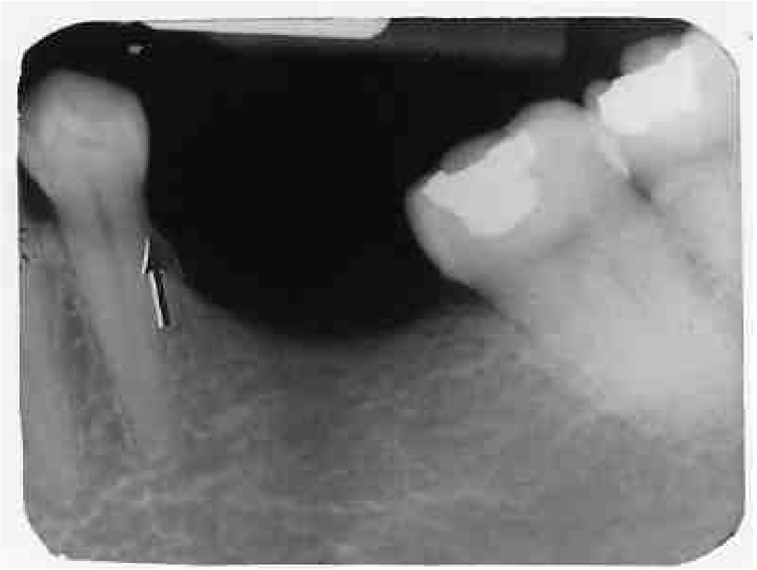


Fig. 5-18B

Disappearance of cervical burnout when x-ray beam angulation and exposure are changed.

Beam Angulation Effects on Caries

Fig. 5-19

Caries visibility is usually better on a bite-wing than on a periapical radiograph.

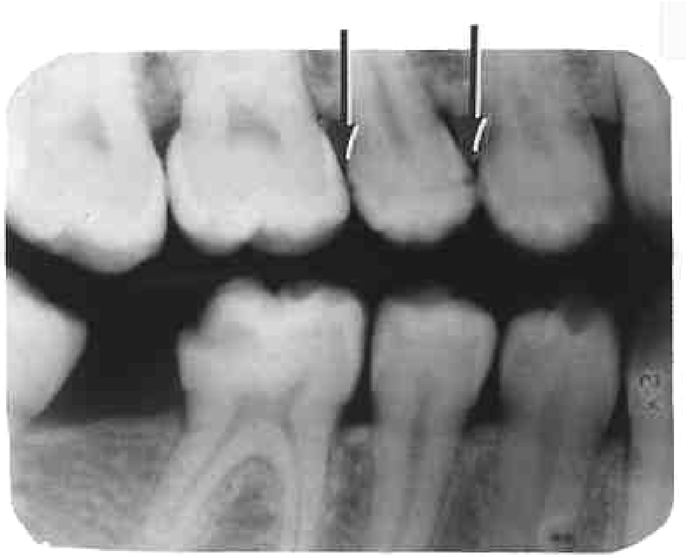


Fig. A

Bite-wing clearly shows the proximal caries on the maxillary second premolar.

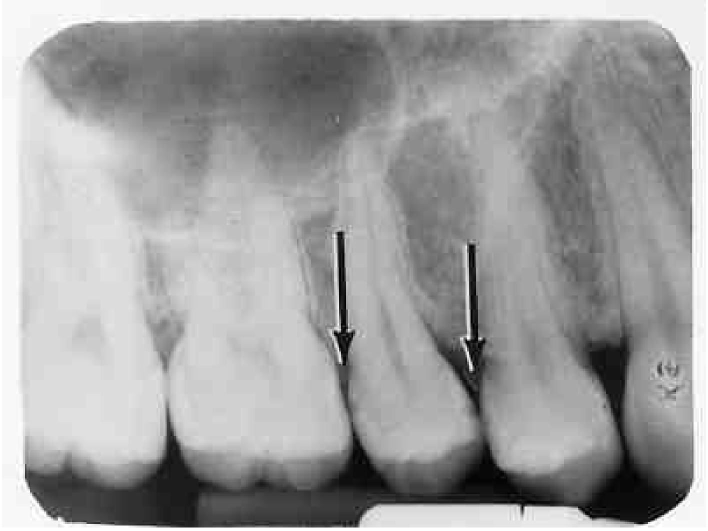


Fig. B

On the periapical radiograph, the proximal caries is not clearly visible as on the bite-wing.

Fig. 5-20

Caries visibility is better using a paralleling technique than a bisecting angle technique.

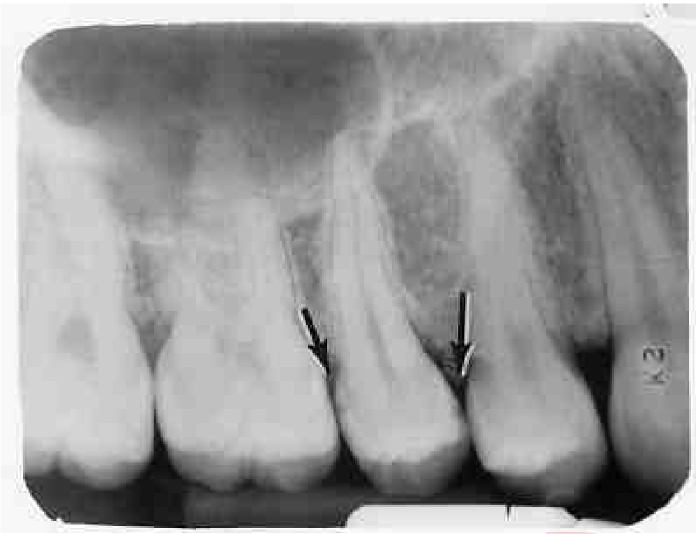


Fig. A

Paralleling technique. The proximal caries on the second premolar is clearly visible.

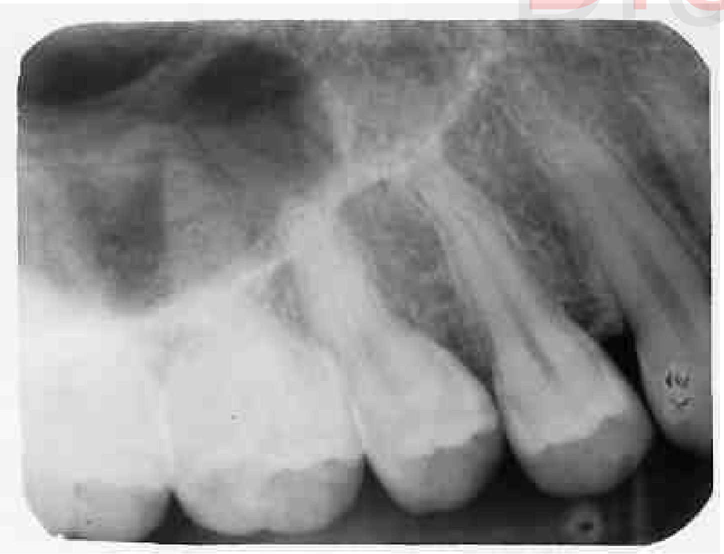
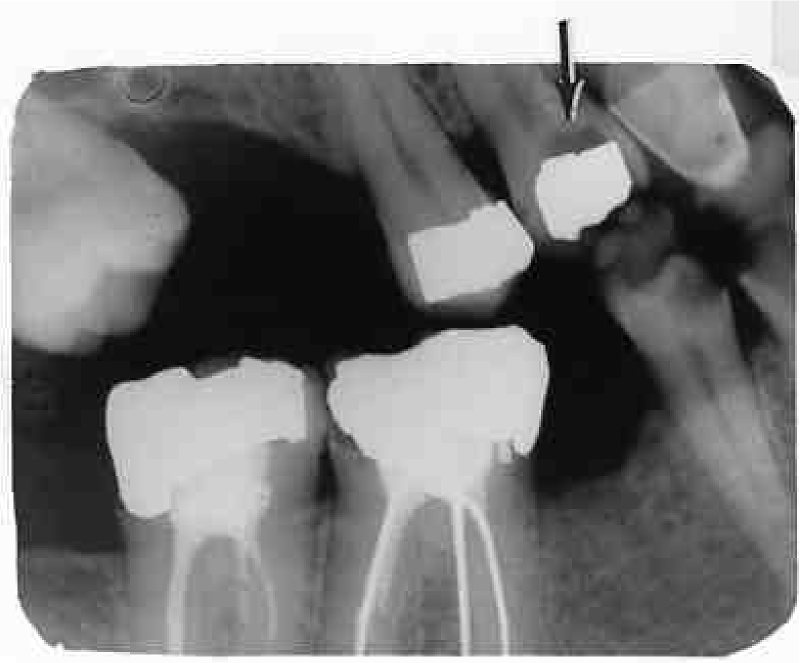


Fig. B

Bisecting angle technique. The proximal caries on the second premolar is not visible.



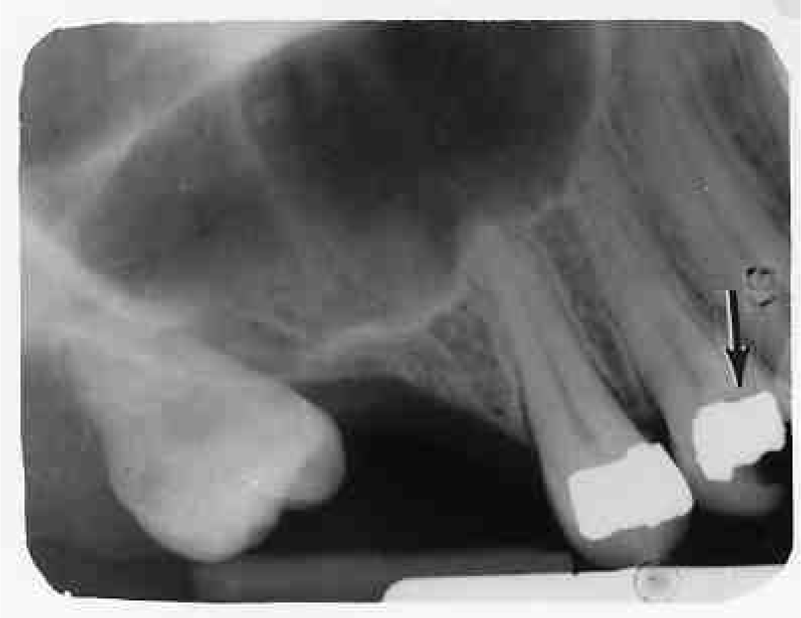


Fig. 5-22

Obliteration of carious lesion when using different vertical angulations of the x-ray beam. Caries visible on bite-wing but not on periapical radiograph.

Fig. A

On the bite-wing, the recurrent caries is visible under the amalgam restoration of the maxillary first premolar.

Fig. B

On the periapical radiograph, the recurrent caries is not clearly visible because of increase in the positive vertical angulation of the x-ray beam.

Fig. 5-23

Obliteration of carious lesion when using different vertical angulations of the x-ray beam. Caries visible on periapical radiograph but not on bite-wing.

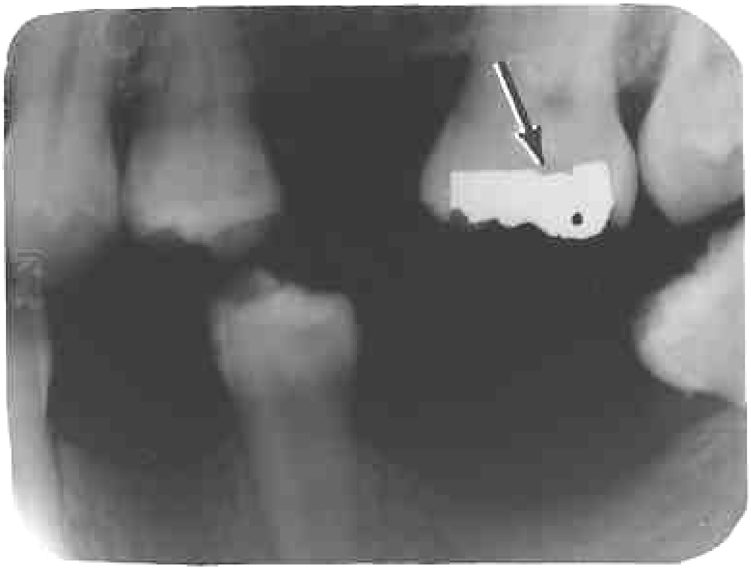


Fig. A

Unlike the previous example (fig. 5-22), this bite-wing does not show the recurrent caries under the amalgam restoration of the maxillary molar.

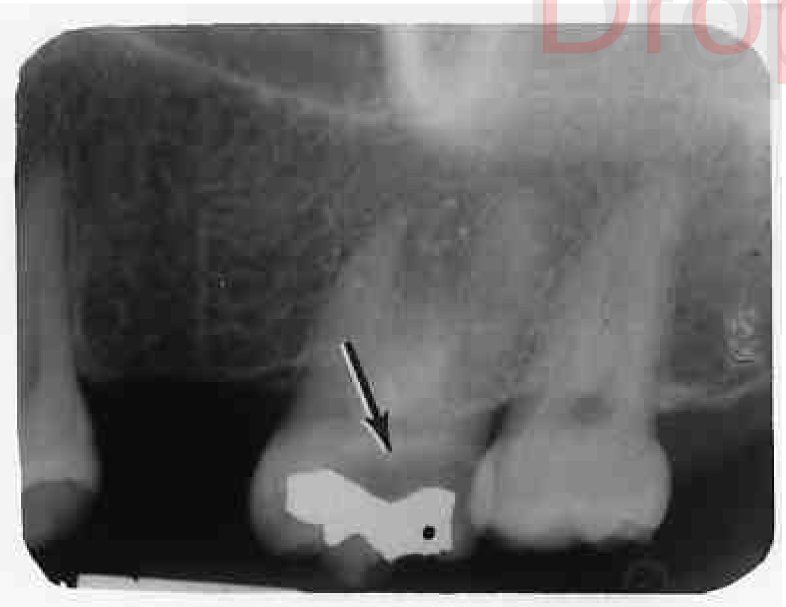


Fig. B

The periapical radiograph shows the recurrent caries under the amalgam restoration. Unlike the previous example (fig. 5-22), this periapical radiograph proved to be superior to the bite-wing in the detection of recurrent caries.

Fig. 5-24

Changes in location of a carious lesion with changes in horizontal angulation of the x-ray beam.

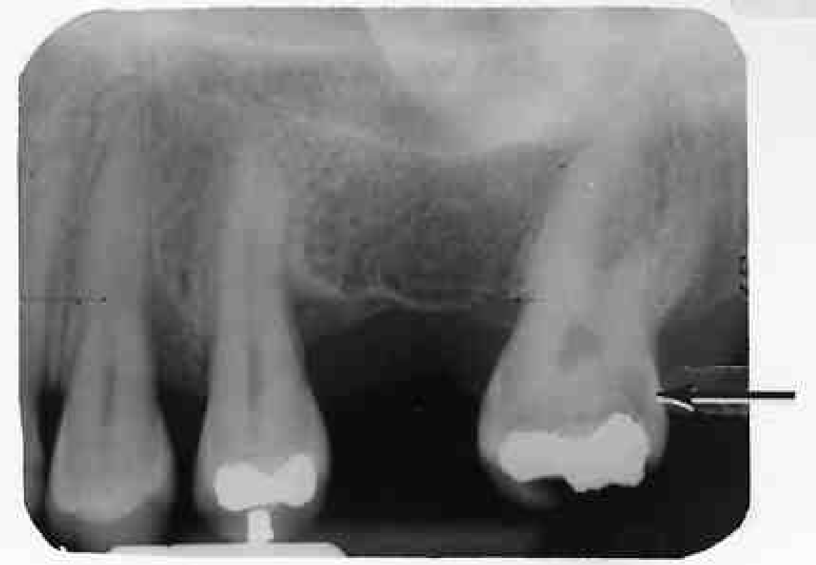


Fig. A

The recurrent caries in the molar is visible near the distal surface of the tooth.

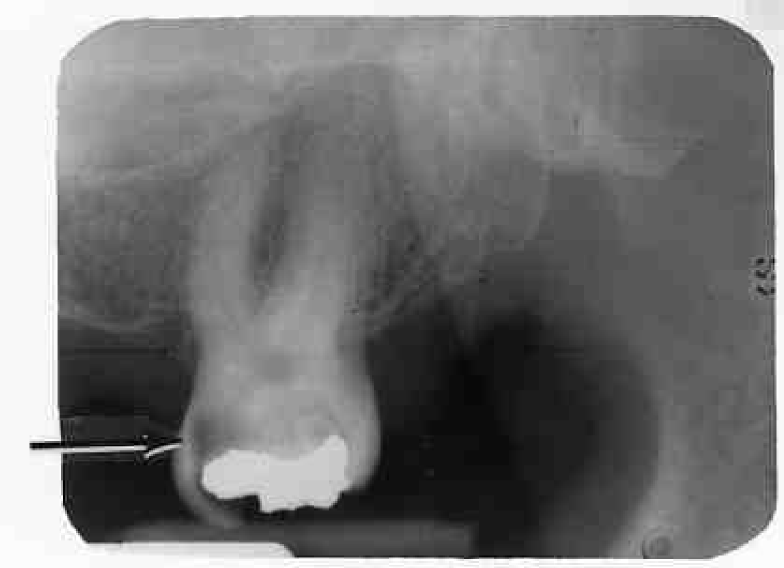


Fig. B

The recurrent caries is now visible near the mesial surface of the tooth because of the change in horizontal angulation of the x-ray beam.

Fig. 5-25

Decrease in the number of amalgam restorations with changes in horizontal angulation of the x-ray beam.

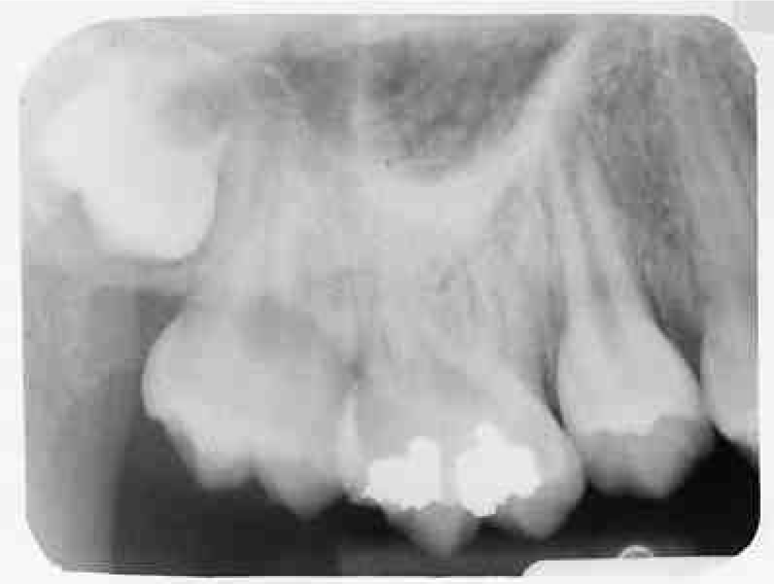


Fig. A

Presence of two amalgam restorations in the first molar.

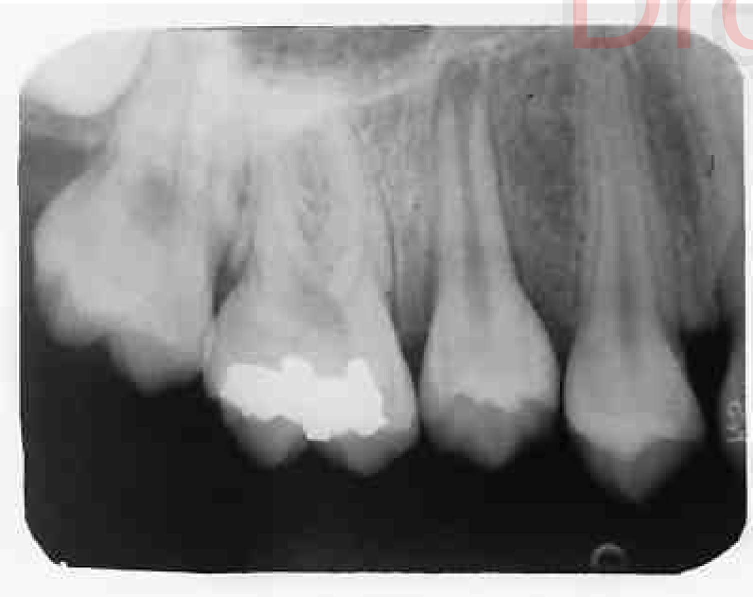


Fig. B

Illusion of one amalgam restoration because of a change in the horizontal angulation of the x-ray beam.